

Interpretive Summary:**Technical Abstract:**

A study was conducted to determine if intake of honey mesquite (*Prosopis glandulosa* Torr.) leaves by sheep could be increased by supplementing activated charcoal at 0.0, 0.33, 0.67 or 1.00 g / kg of body weight. Twenty wether lambs (36.6 ± 0.6 kg) were randomly assigned to the 4 treatment levels. Lambs were fed low-quality Sudan-grass hay at 2% of BW plus 80 g/d of molasses for 7 d, and Sudan-grass hay at 1.9% of BW plus 80 g/d of molasses mixed with the assigned level of activated charcoal for 16 d (d 8 to 23). On d 8 to 23, lambs were also given ad libitum access to honey mesquite leaves that had been previously harvested, frozen, and thawed immediately before feeding. Repeated measures analyses were used to determine if level of activated charcoal fed to lambs affected daily intake of mesquite leaves. No differences ($P = 0.52$) in intake of mesquite leaves were detected. Mean intake of mesquite leaves was 20.7 ± 3.7 , 23.8 ± 3.8 , 20.2 ± 3.7 , and 27.3 ± 3.7 g/d for 0.0, 0.33, 0.67 and 1.0 treatment levels, respectively. Consumption of mesquite leaves varied greatly among lambs, ranging from 1.4 to 7.4% of their diet during the last 8 d of the study. No differences in hay intake ($P = 0.23$) or lamb weight gain ($P = 0.58$) were detected among supplemental charcoal treatments. Future studies examining the consumption of honey mesquite leaves by sheep should consider the potential variability in intake among individual animals.

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SYMPOSIA AND ORAL SESSIONS
Graduate Student Competition: ASAS Western Section
Graduate Student Paper Competition

17 Effect of supplementing activated charcoal on intake of honey mesquite leaves by lambs. P. Mayagoitia*¹, D. Bailey¹, and R. Estell², ¹New Mexico State University, Las Cruces, ²USDA-ARS Jornada Experimental Range, Las Cruces, NM.

A study was conducted to determine if intake of honey mesquite (*Prosopis glandulosa* Torr.) leaves by sheep could be increased by supplementing activated charcoal at 0.0, 0.33, 0.67 or 1.00 g / kg of body weight. Twenty wether lambs (36.6 ± 0.6 kg) were randomly assigned to the 4 treatment levels. Lambs were fed low-quality Sudan-grass hay at 2% of BW plus 80 g/d of molasses for 7 d, and Sudan-grass hay at 1.9% of BW plus 80 g/d of molasses mixed with the assigned level of activated charcoal for 16 d (d 8 to 23). On d 8 to 23, lambs were also given ad libitum access to honey mesquite leaves that had been previously harvested, frozen, and thawed immediately before feeding. Repeated measures analyses were used to determine if level of activated charcoal fed to lambs affected daily intake of mesquite leaves. No differences ($P = 0.52$) in intake of mesquite leaves were detected. Mean intake of mesquite leaves was 20.7 ± 3.7, 23.8 ± 3.8, 20.2 ± 3.7, and 27.3 ± 3.7 g/d for 0.0, 0.33, 0.67 and 1.0 treatment levels, respectively. Consumption of mesquite leaves varied greatly among lambs, ranging from 1.4 to 7.4% of their diet during the last 8 d of the study. No differences in hay intake ($P = 0.23$) or lamb weight gain ($P = 0.58$) were detected among supplemental charcoal treatments. Future studies examining the consumption of honey mesquite leaves by sheep should consider the potential variability in intake among individual animals.

Key Words: sheep, rangeland, secondary compounds

18 Pre-breeding β -hydroxybutyrate concentration influences conception date in young postpartum range beef cows. J. T. Mulliniks*¹, M. E. Kemp¹, R. L. Endecott², S. H. Cox¹, E. J. Scholljegerdes¹, T. W. Geary³, and M. K. Petersen³, ¹New Mexico State University, Las Cruces, ²Montana State University, Miles City, ³USDA-ARS, Fort Keogh Livestock and Range Research Laboratory, Miles City, MT.

Cows in negative energy balance after calving often have reduced reproductive performance, which is suggested to be mediated by metabolic signals. The objective of this 3-yr study was to determine the association of serum metabolites, resumption of estrus, milk production, cow BW change, BCS, and calf performance on conception date in 2- and 3-yr-old beef cows ($n = 131$) grazing native range at the Corona Range and Livestock Research Center. Cows were classified by conception date in a 60-d breeding season as early conception (EC; conceived in the first 15 d of breeding) or late conception (LC; conceived during the last 45 d of breeding). Date of conception was calculated from the subsequent calving date. Beginning on d 30 postpartum, blood samples were collected twice/wk for serum metabolite analysis and progesterone analysis to estimate days to resumption of estrous cycles. As a chute-side measure of nutrient status and glucose sufficiency, whole-blood β -hydroxybutyrate (BHB) concentrations were measured 2 wk before breeding. A random subsample of cows from groups was mechanically milked approximately 57 d postpartum. Whole-blood BHB and serum glucose concentrations were lower ($P \leq 0.04$) in EC cows than

LC cows. Serum insulin concentrations were greater ($P = 0.03$) in EC cows relative to LC cows. Serum NEFA and urea N concentrations were not different ($P \geq 0.32$) between EC and LC cows. Initial calving date during the year of the study was not different ($P = 0.19$) between EC and LC cows. The postpartum anestrus interval was shorter ($P = 0.04$) in EC cows, indicating that the earlier conception was due partially to an earlier return to cyclicity. Milk production was not different ($P = 0.28$) between EC and LC cows. Cow BW and BCS and were not different ($P \geq 0.12$) at any period between EC and LC cows. Calf weaning (205-d) BW was not different ($P = 0.67$) between EC and LC cows. This study indicates that blood BHB concentrations before breeding may provide a sensitive indicator of energy status for rebreeding success in young beef cows as measured by interval to conception.

Key Words: beef cows, conception date, β -hydroxybutyrate

19 Effects of algal meal supplementation to finishing wethers on performance and carcass characteristics. M. G. Dib,* T. E. Engle, H. Han, I. N. Roman-Muniz, and S. L. Archibeque, Colorado State University, Fort Collins.

Crossbred wethers ($n = 40$; initial BW = 45.3 kg + 3.5) were used in a randomized complete block design to evaluate the effects of titrated concentrations of algal meal as a protein supplement on live performance, live health status and carcass characteristics. Wethers were blocked by time and randomly assigned to one of the 5 treatments. Treatments included (1) soybean meal and rice meal as protein supplementation sources (CON); (2) 5% of algae meal on a DM basis as a protein replacement (5%A); (3) 10% of algae meal on a DM basis as a protein replacement (10%A); (4) 15% of algae meal on a DM basis as a protein replacement (15%A); and (5) 20% of algae meal on a DM as a protein replacement (20%A). All diets were isocaloric and isoproteic. All wethers were fed a high concentrate finishing diet once daily in individual stalls. Wethers were individually weighed on d -1, 0, 21, and 28. On d 21, wethers were transported to metabolic crates for determination of nutrient digestibility and retention. On d 28, animals were transported to a commercial abattoir for harvest. Initial (45.4 kg) and final (44.5 kg) BW, ADG for feedlot period (0.24 kg/d), ADG for metabolism period (-0.84 kg/d), DMI (1.38 kg/d), and G:F (0.187) were similar ($P > 0.05$) across treatments. Furthermore, hot carcass weight, subcutaneous adipose depth, Longissimus muscle area, calculated YG, marbling score, dressing percentage, muscle percentage, body wall thickness, Leg score, Leg circumference, flank streaking, quality grade, carcass conformation and carcass length were also similar ($P > 0.05$) across treatments. Research results suggest that feeding up to 20% of algae co-product meal as a replacement protein source to finishing wethers is feasible with limited impact on performance and carcass characteristics as compared with the standard protein sources that have been used by the industry. Further research may be necessary to determine the response of different levels of supplementation of algal meal for sheep, effects on animals in a different physiological stage or effects on other ruminants in the finishing diet on performance and carcass merit.

Key Words: algae, protein, co-product